

Review on Factors That Affect Feed Efficiency and Indirect Effect of Selection for Efficiency on Some Traits

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Feed efficiency and profitability are influenced by dry matter intake (DMI), production level, body weight, body tissue changes, age at first calving (AFC), and environment factors. During the past 18 years milk production in Canada has increased 115 kg/cow/yr and it likely will continue to increase. Vandehaar (1998) proposed that above of 15000 kg/yr, the marginal increase in efficiency reaches to zero. The optimum point of gross energy efficiency occurs when the cows consume 3 times of their maintenance requirements. The positive correlation between body size, milk production and efficiency that has existed in past, it may taper in future. Loss of body reserves increase efficiency but the side effects on other traits like reproduction should be considered. Reducing the AFC can increase animal lifetime efficiency however should take care of the standard weight at calving. Heat stress has severe negative effect on efficiency rather than cold stress. Long day increases milk production and subsequently DMI and efficiency.

As the traits are correlated with each other, the selection for efficiency can have affect on other traits. Feed efficiency (4% FCM/DM) has increased from 0.91 to 1.2 due to increase in the milk production (1.35% per year) but genetic trend of average daughter fertility has shown 2% decreased over 14 years. The negative effect of selection for efficiency were reported on reproductive performance in swine and poultry but no differences reported between reproduction performance of efficient and non efficient beef sire. The results of studies on feeding behaviour in feedlot steers, mice and hens demonstrated that efficient animal had less activity. Although efficient steers are less susceptible to stress, efficiency positively correlated with incidences of respiratory and 'other' diseases in dairy bulls (Wassmuth et al., 2000).

Implications: the relationship between feed efficiency and milk production, body weight, feed intake is not linear and they have an optimum point. The effect of selection for efficiency needed to study on reproduction, health and other traits.